【DOCUMENT】 SPECIFICATION

【TITLE OF INVENTION】

Isolation Transformers

【CLAIMS】

【CLAIM 1】 An isolation transformer comprised by a multi-layer, multi-winding primary coil, a multi-layer, multi-winding secondary coil, and a core that forms a magnetic path between the aforementioned primary coil and the aforementioned secondary coil functions as an isolation (noise-cutoff) transformer by changing the coil layers of one or both of the coils formed by winding an insulated, covered, copper-wire to a multi-layer, multi-winding coil, into which a number of short-circuit rings made of conducting films are inserted and layered, and

the surface area of the aforementioned conducting short-circuit rings is made approximately as large as that of the neighboring coil-layers, and their thickness is made approximately identical to or less than the skin depth of the induced current generated by the skin effect in the high-frequency region, where resonances should be suppressed.

【CLAIM 2】 An isolation transformer comprised by a multi-layer, multi-winding primary coil, a multi-layer, multi-winding secondary coil, and a core that forms a magnetic path between the aforementioned primary coil and the aforementioned secondary coil, functions as an isolation transformer by changing the coil layers of one or both of the coils formed by winding spirally an insulated, covered, copper-wire to a multi-layer, multi-winding coil, into which a number of short-circuit rings made of conducting films are inserted and layered, and

the planer configuration of the aforementioned conducting short-circuit rings is made approximately identical to that of the neighboring coil-layers, and their thickness is made approximately identical to or less than the skin depth of the induced current generated by the skin effect in the high-frequency region, where resonances should be suppressed.

【CLAIM 3】 An isolation transformer comprised by a multi-layer, multi-winding primary coil, a multi-layer, multi-winding secondary coil, and a core that forms a magnetic path between the aforementioned primary coil and the aforementioned secondary coil functions as an isolation transformer by changing the coil layers of one or both of the coils formed by winding cylindrically an insulated, covered, copper-wire to a multi-layer, multi-winding coil, into which a number of short-circuit rings made of conducting films are inserted and layered, and

the inner surface area of the aforementioned cylindrical short-circuit rings is made approximately identical to the outer surface of the neighboring coil, and their thickness is made approximately identical to or less than the skin depth of the induced current generated by the skin effect in the high-frequency region, where resonances should be suppressed.

【CLAIM 4】 An Isolation transformer of claim 1, ~~2, or 3~~ characterized by the aforementioned short-circuit ring inserted into every inter-coil-layer space.

【CLAIM 5】 An Isolation transformer of claim 1, ~~2, or 3~~ characterized by the aforementioned short-circuit ring inserted into selected inter-coil-layer space.

【CLAIM 6】 An Isolation transformer of claim 1, ~~2, or 3~~ characterized by the aforementioned short-circuit rings made by laminating plastic films.

【CLAIM 7】 An Isolation transformer of claim 1, ~~2, or 3~~ characterized

by the aforementioned short-circuit rings of thickness of 7 μm or less.

【CLAIM 8】 A transformer comprised by a multi-layer, multi-winding primary coil, a multi-layer, multi-winding secondary coil, and a core that forms a magnetic path between the aforementioned primary coil and the aforementioned secondary coil functions as an isolation transformer by changing the coil layers of one or both of the coils formed by winding an insulated, covered, copper-wire to a multi-layer, multi-winding coil, and

each layer of the multi-layer, multi-winding coil is formed by winding an insulated, covered, copper-wire, the surface of which is further covered with a conducting film that is made approximately as thick as or less thicker than the skin depth of the induced current generated by the skin effect in the high-frequency region, where resonances should be suppressed.

【CLAIM 9】 An Isolation transformer of claim 8 characterized by the aforementioned conducting thin film of thickness of 7 μm or less.

【DETEILED DESCRIPTION OF THE INVENTION】

【0001】

【TECHNICAL FIELD TO WHICH THE INVENTION BELONGS】

This invention is related to isolation transformers that suppress high-frequency electromagnetic noise (hereafter called noise) transmitted through power transmission lines and/or signal transmission lines.

【0002】

【DESCRIPTION OF THE PRIOR ART】

Micro-computers are being used in various fields such as information, communication, and other industries in addition to daily